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The Development of an Integrated Performance Category System for Supervisory Jobs in the U.S. Navy

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When a single job is the target, established job analysis approaches provide relatively straightforward methods for identifying performance requirements. However, when multiple jobs are involved, the identification of a single set of relevant performance dimensions can be more daunting. In the application here, there was also a compelling requirement to develop a dimension set that conformed with U.S. Navy fleet personnel perceptions of the performance domain. Accordingly, the behavioral performance constructs that experienced Navy officers believed differentiate effective from ineffective supervisory performance were gathered using a personal construct theory protocol. We then used a methodology suggested by Borman and Brush (1993) to integrate and summarize these personal work constructs, to provide—through a series of qualitative and quantitative strategies—a dimension set targeted toward supervisors in all Navy communities. The resulting dimensions revealed certain themes that might not have emerged if traditional job analysis strategies had been used. The dimension set and the resulting behaviorally anchored rating scales appear widely relevant to Navy supervisor jobs, and the performance appraisal system that employs the scales is nearing implementation. In addition, performance feedback and development tools were developed to complement the performance appraisal system.

In the fall of 2000, an "Executive Review of Navy Training" was chartered by the Chief of Naval Operations (CNO) to examine the current state of training in the Navy and to recommend actions that would lead to a "revolution in training." One result of this review was the formation of a Task Force for Excellence through Commitment to Education and Learning (EXCEL). The vision was to provide clearly defined career paths and milestones, giving sailors the tools and opportunities they need to grow professionally and personally. Thus, Task Force EXCEL's mission was to identify new ways the Navy can train, grow, place, and utilize personnel that maximizes their ability to accomplish the Navy mission and makes for a more productive and satisfying workplace.

RESEARCH AND DEVELOPMENT OBJECTIVES

Our particular challenge within this broader framework was the development of performance management systems for all Navy supervisory and nonsupervisory jobs. Both performance appraisal, and feedback and development tools were needed to support the management of Navy personnel. Two primary objectives guided this research and development effort. First, these tools would need to provide Navy supervisors with a mechanism for evaluating performance and offering performance feedback as well as provide management with a process for offering long-term career development opportunities. Second, it also was deemed essential that the project adopt, as a fundamental tenet, fleet involvement in all phases of the development process. The notion here was that previous performance appraisal initiatives had been "headquarters solutions," with little input from fleet personnel. Therefore, a highly important requirement was to develop a performance appraisal instrument that would reflect the way experienced supervisors in the Navy conceptualized the performance requirements of Navy supervisory and nonsupervisory jobs. The belief among senior management, as well as the officers and enlisted we worked with, was that a more behavior-based system reflecting fleet values was needed. As noted earlier, our efforts focused on developing performance management systems to cover all supervisory and nonsupervisory jobs. Because we used a similar approach for both types of jobs, we present only the supervisory solution for illustrative purposes.

APPROACH

Defining the Performance Domain

An important first step in developing a framework for coverage of the performance domain for supervisory jobs in the Navy was to identify all of the behaviors that characterize this domain and to determine how they are related. Subsequently, it

was necessary to reduce the universe of dimensions to a manageable number that would still represent the entire performance domain.

The process chosen was a combination of a personal construct theory (Kelly, 1955) application and a strategy recommended by Borman and Brush (1993), in their examination of managerial performance taxonomies, and later applied by Borman, Ackerman, and Kubisiak (1994) in a large-scale study with the Department of Labor. The first stage relies on experienced subject matter experts (SMEs) to generate performance behaviors that differentiate between effective and ineffective supervisors using a modified reparatory grid approach (Borman, 1987). The second stage requires that a second group of SMEs categorize all these behaviors and definitions into clusters based on content similarity. The final stage relies on data analytic techniques to compare and pool the category solutions generated previously and then provides a final performance category solution by means of principal components analysis (PCA).

Briefly, personal construct theory posits that, based on their experiences over time, individuals develop categories or dimensions that they use to interpret and make judgments about events or objects, especially other people. Personal construct theorists believe that these categories represent the natural way that people think about their world, again, especially regarding other people (e.g., Adams-Webber, 1979). The reparatory grid protocol has provided a method for individuals to generate their personal constructs by contrasting different role persons (e.g., mother, best friend). In this application, we were asking participants to generate their personal constructs related to job performance, what have been referred to as personal work constructs, or "folk theories" of performance (Borman, 1987). Again, this personal construct theory approach addressed the requirement that the performance dimensions be the result of a fleet solution, with the final dimension set emerging from the way fleet personnel conceptualize supervisory job performance requirements.

Performance behavior generation. The first stage of defining the performance domain focused on gathering information about the important components that lead to superior performance by supervisory personnel. Participants were told that their task was to identify at least five very effective and five less effective officers they had known or served with in the past and to focus on what types of behaviors differentiated pairs of these effective and ineffective officers. This protocol for generating performance-related behaviors is based on the reparatory grid approach used by George Kelly and his followers to generate personal constructs (Kelly, 1955).

Performance behavior generation workshops were conducted at Naval installations on both the East Coast and West Coast of the United States. Participants were selected so as to produce a diverse cross-section of officers, with respect to type of duty assignment (e.g., aviation, surface, submarine), level of experience (i.e.,

mid-to-high level), and area of specialization (e.g., mechanical, avionics, medical). A total of 55 experienced officers participated. The officers in these workshops averaged over 16 years of active duty service in the Navy, had worked in a supervisory capacity for almost 15 years, and had been at their current command for over 1 year. Most of the participants were White (78%) and men (76%) and had a 4-year college degree or higher. In fact, 47% of the participants had a graduate degree of some form. Participants were currently assigned to aviation, surface force, submarine force, or shore-based activities, with the largest group (47%) currently assigned to shore-based activities.

Performance behavior generation workshop participants generated a total of 529 behaviors. Each individual generated from 3 to 16 behaviors, and on average each person wrote 9.62 behaviors. These supervisory behaviors and definitions, produced by workshop participants, were reviewed and edited by project personnel to a common format and to reduce redundancy. In addition, each behavior was reviewed for multidimensionality and, where necessary, was separated into its constituent components to make it unidimensional. The end result of this review was 126 behaviors covering the performance domain for supervisory jobs in the Navy. Table 1 presents example behaviors resulting from this process.

Sorting of performance behaviors. The next stage in defining the performance domain involved reducing the total behaviors to a smaller but representative set of performance categories. This was accomplished by using a sorting task that asked SMEs, working independently, to sort the 126 behaviors into categories according to similarity of content.

The card sorting workshops were conducted with 23 officers at naval installations in the mid-South. Officers were again selected with an eye toward diversity of experience and job type. Participants averaged over 14 years of active duty service in the Navy and had held supervisory positions for almost 12 years. Workshop participants were primarily White (83%) and men (74%), and most had obtained a graduate level degree (52%). All of the group members were currently assigned to shore-based activities.

Participants were instructed to sort the behaviors appearing on 3×5 cards according to their similarity in content. Essentially, participants were encouraged to use the cards to derive their own ideal performance measurement system for Navy supervisory jobs. After sorting all of the performance behaviors into summary categories, each individual labeled and defined the categories. Participants were encouraged to try to place all of the behaviors into a defined category but were also allowed to place them in a "miscellaneous" or "does not fit" category if necessary. They were also encouraged to have between 5 and 15 categories in their system.

Pooling of behaviors and PCA. The final stage in defining the performance domain involved collecting and comparing participants' solutions. Spe-

TABLE 1
Example Items From Performance Behavior Sorting Workshop

Ability to adapt to new and changing missions, tasks, and situations
Expressing oneself in a manner that is conducive to a productive and harmonious environment
Delegating work according to priority and the abilities of the available subordinates
Balancing self development and training with job completion such that performance does not suffer
Providing prompt, regular, and specific feedback to subordinates
Using resources efficiently and effectively to maximize benefit and minimize both short- and long-term costs
Effectively adopting different leadership styles as appropriate to individuals and settings
Accepting responsibility for one's own actions and the actions of subordinates
Supporting Navy and Command missions and goals willingly, regardless of personal feelings
Providing informational resources to ignite and stimulate in your subordinates a personal or professional desire for self-improvement
Ability to identify goals, assess available resources, and develop an effective plan to achieve a goal
Listening attentively to others, making them feel comfortable and valuable while conversing, whether giving direction or seeking information
Providing timely and relevant information up and down the chain of command
Ability to adjust to a rapidly changing environment and modify goals and objectives based on emerging requirements
Counseling subordinates accurately and honestly and assisting them with self-improvement
Understanding how policies and actions fit into the overall mission scheme
Adapting to stress effectively and remaining calm, focused, and competent in stressful situations
Persuading, inspiring, and motivating others, regardless of their relative positions in the hierarchy
Displaying uncompromising values, such as honor, courage, commitment, integrity, and honesty
Having a thorough understanding of military regulations and initiatives and carrying them out in accordance with Navy standards
Displaying appropriate courtesies to superiors, peers, and subordinates
Taking personal ownership of tasks, displaying dedication to goals and standards
Providing programs for upward mobility and promotion through group and individual counsel
Effectively building and leading individual and team outcomes

cifically, for each pair of performance behaviors, the proportion of participants who sorted both behaviors into the same category was computed via a Fortran program. For example, if Behaviors 1 and 2 were sorted into the same category by 8 of the 23 officers, .35 was placed in the 1-2 entry for the proportion matrix. Table 2 shows the frequency distribution of the 126×126 proportion matrix and depicts for various proportional magnitudes the frequency with which the 7,875 item pairs were sorted into the same category by the 23 participants.

This was followed by also computing an indirect similarity index, which indicated for any behavior pair the degree of correspondence between each of these two behaviors' patterns of similarity with all the other behaviors. When one behavior's pattern of similarities with other behaviors corresponds closely to a second behavior's pattern of similarities with these same other behaviors, then the indirect similarity correlation between these two is high. When this correspondence be-

TABLE 2
Frequency Distribution of Personal Construct
Sorting Proportion Matrix

Range	Frequency	%
.90-.99	2	0.03
.80-.89	10	0.13
.70-.79	57	0.72
.60-.69	83	1.05
.50-.59	103	1.31
.40-.49	200	2.54
.30-.39	564	7.16
.20-.29	754	9.57
.10-.19	1,384	17.57
.01-.09	2,732	34.69
0	1,986	25.22

tween the two performance behaviors' similarities with the other behaviors is lower, then the indirect similarity correlation is lower. As an example, consider Behaviors 1 and 2 again. Suppose part of the proportion matrix looked like Table 3.

The indirect similarity correlation using just the data shown would be .81 ($N = 6$). Of course, in the actual development of the indirect similarity matrix the size of these correlations was 124. In this way, the judgments of all participants were captured and pooled.

These two steps produced a similarity correlation matrix, consisting of correlations between each pair of performance behaviors, which was then submitted to a PCA with orthogonal rotation of components to a varimax solution. Component solutions, ranging between 5 and 15, were analyzed and interpreted. Results from the PCA indicated that the eight-component solution was the most interpretable. The criteria for assigning a performance statement to a category was a loading of .50 or greater and less than .20 on the remaining components. Table 4 depicts the final PCA solution. It should be noted that the PCA rotated solution was very clean, with the mean factor loading for all behaviors on the factors they defined equal to .75, and the mean loading on the other factors equal to .14. The eight performance categories that resulted from the PCA were reviewed, labels were applied, and definitions were written to clearly describe and differentiate the categories.

TABLE 3
Sample Matrix of Behaviors 1 and 2

	1	2	3	4	5	6	7	...	126
Behavior 1	—	.35	.61	.04	.09	.50	.2132
Behavior 2	.35	—	.42	.13	.19	.35	.0941

TABLE 4
Interpretation of the Eight Component Solution

<i>Label</i>	<i>Definition</i>
Coaching/Mentoring	Providing guidance to subordinates; assessing strengths and weaknesses in personnel and providing them with honest and specific feedback; designing opportunities for subordinates to develop new skills and assisting them in establishing career plans; providing subordinates with strategic vision and goals; sharing knowledge and experience with subordinates; creating a work environment that makes individuals feel valued and motivates them to excel
Resource Stewardship	Managing resources efficiently and effectively; ensuring deadlines are met through planning and effective communication of objectives; gathering information, identifying goals, assessing available resources, and developing innovative plans to complete projects on time and within budget; prioritizing tasks and delegating work appropriately; relating tasks/assignments to the overall unit mission; sorting through large quantities of information efficiently
Displaying Professionalism and Integrity	Accepting responsibility for own and subordinates' actions; always maintaining ethical principles and telling the truth, regardless of consequences; displaying uncompromising values (e.g., honor, courage, commitment, integrity); willingly undertaking necessary actions, even when physically risky; maintaining sharp military appearance and physical health/fitness; supporting Navy and Command missions and goals
Communication Skills	Practicing meaningful two-way communication (i.e., speaking clearly, listening attentively, and clarifying information); providing timely and relevant information up and down the chain of command; tailoring presentations to the level of the audience; expressing opinions when appropriate; expressing oneself in a manner that produces a productive and harmonious environment; ability to evaluate the importance of information being communicated
Leading Change	Being open to new ideas and new methods for accomplishing goals; ability to adjust to a rapidly changing environment, and modify goals and objectives based on emerging requirements; embracing change and looking for better methods/techniques to accomplish tasks; ability to adapt to new and changing missions, tasks, and situations; remaining calm, focused, and competent in changing or stressful situations
Leading People	Effectively building and leading individual and team activities; persuading, inspiring, and motivating others, regardless of their relative positions in the hierarchy; creating a sense of enthusiasm and purpose in own team; demonstrating a positive attitude, team spirit, and personality to inspire subordinates; effectively adopting different leadership styles as appropriate to individuals and settings
Displaying Organizational Savvy	Having a thorough understanding of military regulations and initiatives and carrying them out in accordance with Navy standards; following policies, regulations, and orders, and defending them to subordinates; understanding the chain of command, and accepting and respecting the decisions of superiors; displaying appropriate courtesies to superiors, peers, and subordinates; understanding how policies and actions fit into the overall mission scheme
Embracing Personal and Professional Development	Continuously improving professional skills, knowledge, and abilities through formal and informal training, off-duty education, on-the-job training, etc.; ability to find purpose, personal benefit, and growth in work; balancing self development and training with job completion such that performance does not suffer; maintaining superior technical skills through training

Developing a Behavior-Based Performance Appraisal Tool

After the performance domain for supervisory Navy jobs had been defined, the next step was to transform the performance categories that covered the domain into a set of performance management tools. Although a variety of approaches was possible, we felt it was important to produce a behavior-based system so that supervisors using the system could base both their evaluation and their feedback on concrete behaviors. Of course, we already had the 126 behaviors, helping to define performance on the eight categories. However, it seemed important to have additional behaviors to define especially the low and mid-range levels of effectiveness for each of the categories (the 126 behaviors were all positively worded). The critical incident method (Flanagan, 1954) appeared ideally suited for supplementing the behavioral content for the categories as well as for encouraging fleet involvement in the development process.

Critical incident generation. This task involved asking experienced officers to describe examples of performance that represented the eight categories. Another group of participants was selected so as to produce a diverse cross-section of officers, with respect to type of duty assignment, level of experience, and area of specialization. The critical incident generation workshop was conducted with 21 officers at a naval installation on the East Coast. Workshop participants averaged almost 18 years of active duty service in the Navy, had supervisory responsibilities for almost 15 years, and had been at their current command less than 2 years. They were primarily White (71%) and men (91%) and had attained at least a 4-year college degree. Approximately 52% of them were assigned to shore-based activities, and 38% were assigned to surface force activities.

Workshop participants produced 161 critical incidents. The critical incidents were reviewed by project personnel for clarity and edited to a common format. In addition, in conversations with a number of workshop participants, and other Navy project personnel, it was suggested that "Mission Accomplishment" was seen as an important "bottom-line" component of performance that was represented in all the dimensions of performance but should be highlighted as a separate dimension. On further discussion and review of the content of the critical incidents, this perspective was confirmed, and it was decided that a ninth performance category should be added to our set of dimensions representative of the supervisory performance domain.

Adopting the behavior summary scale approach developed by Borman (1979), the critical incidents were content analyzed within each performance category, and behavioral summary statements were written that reflected the important themes for that category at the high, mid-range, and low effectiveness levels. These 27 summary statements, then, became the behavioral anchors for the scales.

Anchor retranslation. A critical next step was to verify that these 27 behavioral summary statements written to anchor the three effectiveness levels for each of the nine performance categories represented the behaviors associated with the intended performance category and effectiveness level. This was accomplished by means of an anchor retranslation process.

The anchor retranslation workshop was conducted with 11 officers at a naval installation on the West Coast. Again, selection of participants was based on a desire for diversity of experience. These officers averaged almost 16 years of active duty service in the Navy and had 14 years of supervisory experience. Eighty-two percent of the participants were White, and 82% were men. Most had a graduate degree. Fifty-five percent of the participants were assigned to shore-based activities, 27% were assigned to aviation activities, and the remainder was assigned to either submarine or surface force activities.

Participants were asked to read through each of the 27 summary statements, place them into a relevant performance category, and then rate the effectiveness of the behaviors described in each performance summary statement as high, mid-range, or low effectiveness. Overall, there was a very high level of agreement across raters in terms of placement of anchors in categories and effectiveness levels. In 99.2% of the cases, the officers sorted the performance statements into the intended category and effectiveness level. An example of the rating scale for the "Coaching/Mentoring" dimension for supervisory jobs is presented in Figure 1.

Developing a Performance Feedback and Development System

The performance appraisal tool developed for supervisory jobs was designed to provide a mechanism for formal performance evaluations annually. However, to benefit fully from this service-wide initiative, attention also needed to be focused on improving day-to-day performance on these important categories that comprise the job domain.

Consequently, we developed a set of performance feedback forms that, when linked to the important performance categories in the appraisal tool, provided performance themes for both supervisors and job incumbents to target for development. To accomplish this, we first returned to the performance statements (126 for supervisory jobs) and the critical incidents (161 for supervisory jobs) that served as the raw material for subsequent development of the behavior summary scales. We then extracted relevant dimension-specific performance themes.

These themes were used, along with the behavior summary scale anchors, to provide a more detailed list of behaviors for the feedback system. The rationale here was that we wanted supervisors conducting feedback sessions to have as rich a behavioral depiction of each dimension's domain as possible to provide maximally relevant feedback to job incumbents. Each performance category is defined,

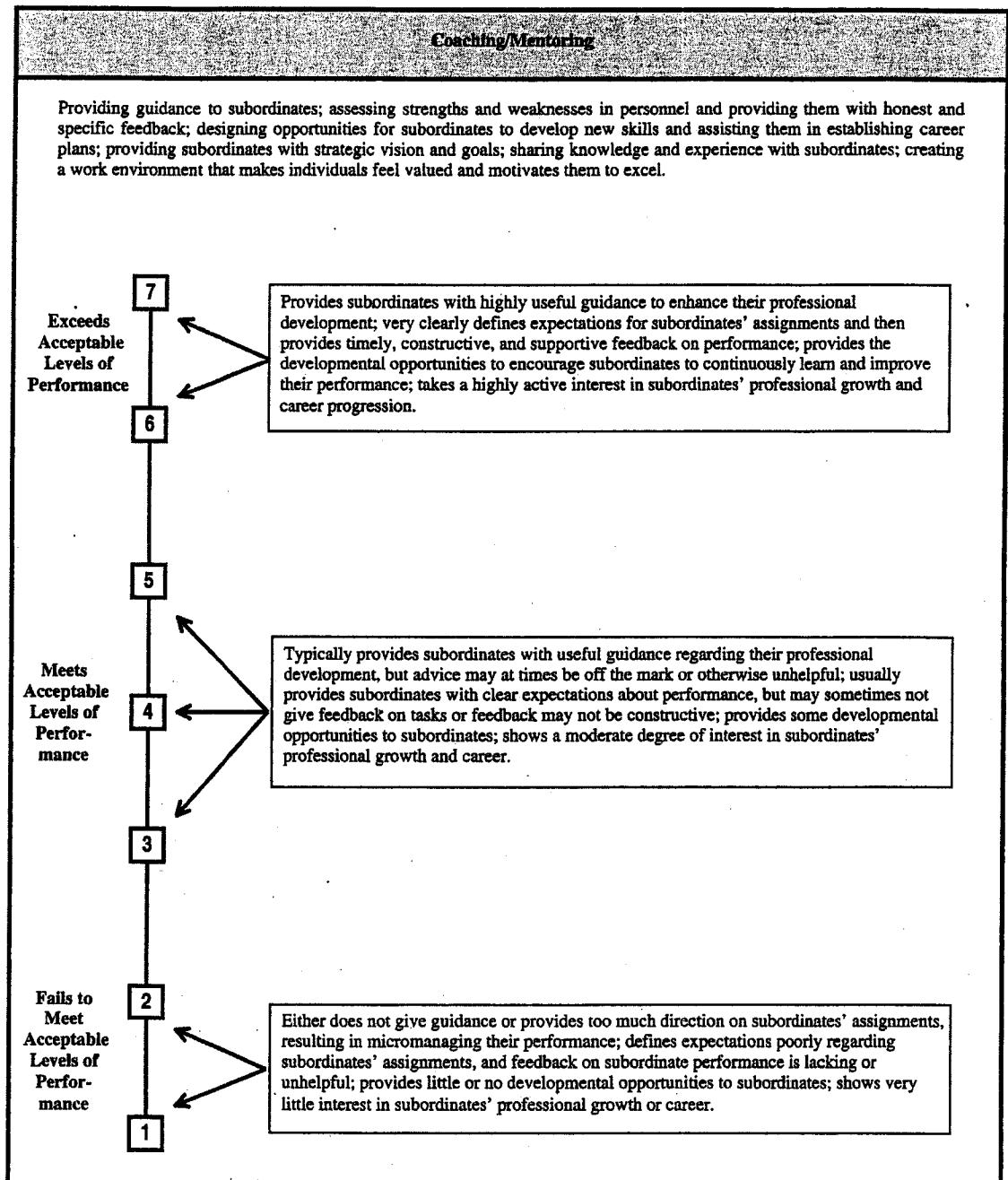


FIGURE 1 Example of rating scale for Coaching/Mentoring dimension.

and then target performance themes are provided. The performance feedback forms provide concrete performance themes at a greater level of specificity than what is available with the rating scale anchors. Consequently, supervisors are able to provide feedback during development sessions directed at specific targeted behaviors within each performance category. An example of the detailed performance themes for the "Coaching/Mentoring" dimension is shown in Table 5.

TABLE 5
Example of Performance Feedback System With Targeted Behaviors
for Coaching/Mentoring Dimension

Coaching/Mentoring	Providing guidance to subordinates; assessing strengths and weaknesses in personnel and providing them with honest and specific feedback; designing opportunities for subordinates to develop new skills and assisting them in establishing career plans; providing subordinates with strategic vision and goals; sharing knowledge and experience with subordinates; creating a work environment that makes individuals feel valued and motivates them to excel
Target behaviors for performance	<p>Provides subordinates with useful guidance on professional development</p> <p>Makes assignments to promote subordinate development and growth</p> <p>Offers suggestions and advice that result in subordinates' learning and increased effectiveness</p> <p>Defines expectations for subordinate performance and helps them set goals</p> <p>Provides training to subordinates and others when they need it</p> <p>Takes an active interest in subordinates' professional development and career progression</p> <p>Discusses with each subordinate their goals and career aspirations</p> <p>Checks on progress of subordinates' professional development and provides advice and support, as appropriate</p> <p>Provides timely, constructive feedback on performance</p> <p>Provides developmental opportunities for subordinates</p>

DISCUSSION

This article detailed the activities undertaken to create a new performance management system for supervisory jobs in the U.S. Navy. As noted previously, although we developed performance management systems in parallel for both supervisory and nonsupervisory jobs (see Hedge, Borman, Bruskiewicz, & Bourne, 2002), space limitations prevented a discussion of both systems.

The question might be asked, how is the approach described here to develop these performance management systems different from other more traditional job analysis strategies, and are the products (i.e., the category systems) really different from what would be expected with more traditional approaches? The answer to the first part of the question we believe is yes. The strategy of using personal construct theory to generate personal work constructs in the target population's own words, and then capturing these officers' views of the structure of constructs would seem to provide in summary form the fleet's perspective on the important performance requirements and how they should be configured. That the retranslation results were almost perfect, considerably better than typically is the case with criterion development using a behaviorally anchored rating scale (BARS) approach, reinforces the notion that this particular configuration of performance categories was very well understood by the officers. In fact, in the context of personal construct

theory, these categories were well differentiated from each other (Kelly, 1955), for this population and this differentiation extended to officers' understanding of different performance levels within each of the categories. As mentioned, in only 1 of 297 (27 Behavior Summary Statements \times 11 Retranslation Subjects) cases, a single officer reversed two of the statements in retranslation.

This rather extreme success in retranslation, compared to typical results in BARS studies, implies that the answer to the second part of the question might also be yes; that is, the dimensional system developed here might have been different from that derived using BARS or some other more traditional methodology. However, it may be instructive to also take a closer look at the categories derived in this study compared to the typical dimensions resulting from supervisory job analysis. First, certainly communication skills, generated in this study, is often seen as a dimension emerging in supervisory job analyses. Similarly, Leadership is almost always a resultant criterion area for supervisor jobs. In the latter case, however, the leadership construct is subdivided into Leading People and Leading Change, arguably two distinct leadership performance constructs, and the Coaching/Mentoring category can be viewed as a third leadership concept, distinct from the other two. Thus, the configuration of the leadership "space" may be somewhat unusual and dissimilar to what might have emerged using more typical methods. For example, in the previous Navy performance appraisal system, there was simply a single "Leadership" dimension. Resource Stewardship is an interesting category in the current system, in that it incorporates planning, organizing, goal setting, and developing solutions to problems, but separates out these activities in relation to the organization and its nonperson resources from activities directly involving subordinates in the organization. Displaying Professionalism and Integrity may not be unusual in content compared to what would be expected from other analysis methods.

The Displaying Organizational Savvy category may be the most unique and nonobvious concept in the new system. It involves a seemingly sophisticated view of following rules, regulations, and policies, and integrating these activities into new initiatives to move decisively toward mission accomplishment. This may be the best example of a construct well understood and embraced by officers as an important performance requirement but emerging only when officers were asked to create their own view of the performance domain, both with respect to their personal work constructs and how those constructs should be configured to create a performance category in this area. Finally, the category Embracing Personal and Professional Development is not unique with respect to supervisory dimension content, but the strong themes of taking personal control over own self-development and ensuring that developmental activities do not get in the way of mission accomplishment seem to reflect a well understood ethic among Navy officers.

Thus, in response to the second question about unique and unusual performance category content and configurations, on balance, our qualitative analysis suggests some commonality with typical supervisory dimensions but also some uniqueness,

especially regarding category configuration. As mentioned, the strong retranslation results suggest that the category system is central to these officers' understanding of Navy supervisory performance requirements.

In sum, the combination personal construct theory and sorting protocol strategy for performance category development may be considered as an alternative to more traditional criterion development approaches. Results in this application were promising although it will be important to compare this strategy with more traditional criterion development strategies (e.g., critical incidents or BARS, task analysis, interviews with management). Such comparisons might include retranslation results (as appropriate), psychometric properties of ratings using the category systems (e.g., interrater reliabilities), and user reactions.

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